

1 CLAIMS

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3 1. Dispensing apparatus comprising an inlet port
4 for coupling to an opening of a container containing
5 flowable material and an outlet port through which
6 the material is dispensed; the inlet and outlet
7 ports being separated by a conduit; a first one-way
8 valve positioned at the inlet port to permit passage
9 of the flowable material from the container into the
10 conduit, and a second one-way valve positioned at
11 the outlet port to permit passage of the flowable
12 material from the conduit; and means for selectively
13 varying the volume of the conduit between the inlet
14 and outlet ports to pump the flowable material.

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16 2. Dispensing apparatus according to claim 1,
17 wherein the conduit is resiliently deformable.

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19 3. Dispensing apparatus according to claim 1 or 2,
20 wherein the respective inlet and outlet ends of the
21 conduit are displaceable relative to each other to
22 selectively vary the volume of the conduit between
23 the inlet and outlet ports.

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25 4. Dispensing apparatus according to any preceding
26 claim, wherein the inlet port is adapted to form a
27 hermetically sealed connection with the opening of
28 the container.

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30 5. Dispensing apparatus according to any preceding
31 claim, wherein a collar for receiving the opening of
32 the container and forming a hermetic seal is mounted
33 on, and surrounds, the inlet port.

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2 6. Dispensing apparatus according to claim 5,
3 wherein the collar is resiliently deformable.

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5 7. Dispensing apparatus according to claim 5 or 6,
6 wherein the collar is annular in shape and has a
7 substantially planar upper end surface, a
8 substantially planar lower end surface and
9 substantially cylindrical internal and external
10 surfaces.

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12 8. Dispensing apparatus according to claim 7,
13 wherein at least part of the internal surface of the
14 resilient collar tapers inwardly from the upper end
15 surface around its entire circumference to form a
16 frusto-conical profile.

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18 9. Dispensing apparatus according to claim 7 or 8,
19 wherein at least one upstanding annular sealing ring
20 extends from the upper end surface.

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22 10. Dispensing apparatus according to claim 9,
23 wherein the or each upstanding annular sealing ring
24 is formed integrally with the resilient collar.

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26 11. Dispensing apparatus according to any of claims
27 6 to 8, wherein the resilient collar is made from a
28 silicone material.

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30 12. Dispensing apparatus according to any of claims
31 5 to 11, wherein a substantially rigid housing
32 surrounds the collar and the inlet port.

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1 13. Dispensing apparatus according to claim 12,
2 wherein a radial flange portion projects inwardly
3 from the lower peripheral edge of the housing.

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5 14. Dispensing apparatus according claim 13,
6 wherein the inlet end of the conduit proximate the
7 inlet port is supported on the radial flange.

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9 15. Dispensing apparatus according to claim 14,
10 wherein the inlet port is interposed between the
11 conduit and the collar.

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13 16. Dispensing apparatus according to any of claims
14 12 to 15, wherein projections are provided on the
15 exterior of the housing, said projections being
16 releasably connectable to a wall-mountable casing
17 such that the dispensing apparatus and the container
18 are locatable within said casing.

19

20 17. Dispensing apparatus according to claim 16,
21 wherein a cradle member is pivotably and
22 releasably mounted on the casing.

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24 18. Dispensing apparatus according to claim 17,
25 wherein cam surfaces are provided on the cradle
26 member.

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28 19. Dispensing apparatus according to claim 18,
29 wherein cam surface engaging portions are provided
30 on the outlet port.

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32 20. Dispensing apparatus according to claim 19,
33 wherein the cam surface engaging portions are

1 diametrically opposed projecting pins.

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3 21. Dispensing apparatus according to any of claims
4 17 to 20, wherein the cradle member has two
5 sidewalls and a supporting surface adapted to
6 receive a toothbrush head.

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8 22. Dispensing apparatus according to claim 21,
9 wherein the supporting surface is provided with a
10 push surface for selective engagement with the
11 distal end of the toothbrush head.

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13 23. Dispensing apparatus according to any preceding
14 claim, wherein the flowable material is semi-solid.

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16 24. Dispensing apparatus according to claim 23,
17 wherein the flowable semi-solid material is
18 dentifrice material.

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20 25. Dispensing apparatus according to any preceding
21 claim, wherein the conduit is a bellows pump.

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23 26. Dispensing apparatus according to any preceding
24 claim, wherein the inlet port is perforated.

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26 27. Dispensing apparatus according to any preceding
27 claim, wherein the first one-way valve is an
28 umbrella valve.

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30 28. Dispensing apparatus according to any preceding
31 claim, wherein the second one-way valve is a
32 duckbill valve.

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1 29. A method of dispensing flowable material from a
2 container using the dispensing apparatus according
3 to any of claims 1 to 28, comprising the steps of:

- 4 (i) coupling the opening of a container with an
5 inlet port of the dispensing apparatus;
6 (ii) priming the dispensing apparatus to remove
7 any air within the apparatus or the container
8 by sequentially reducing and increasing the
9 volume between the inlet port and an outlet
10 port in a pumping action; and
11 (iii) reducing the volume between the inlet and
12 outlet ports to pump the dentifrice material
13 from the container and through a first one-way
14 valve, a conduit and a second one-way valve
15 respectively.

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17 30. A method of dispensing flowable material from a
18 container according to claim 29, wherein the step of
19 reducing the volume between the inlet and outlet
20 ports is achieved by applying a force to compress
21 the conduit longitudinally.

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23 31. A method of dispensing flowable material from a
24 container according to claim 30, wherein the step of
25 applying a longitudinal force is achieved by
26 pivoting a cradle member having cam surfaces about a
27 pivot axis, said cam surfaces moving cam surface
28 engaging portions provided on the outlet port, thus
29 moving the outlet port towards the inlet port.

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31 32. A method of dispensing dentifrice material from
32 a container according to claim 31, wherein the step
33 of pivoting the cradle member is achieved by

1 positioning a toothbrush head on the cradle member
2 and applying a force in a direction corresponding to
3 the longitudinal axis of the toothbrush.